



HOLLYFRONTIER

0150004  
C-10961

July 24, 2013

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BUREAU OF AIR

Ms. Rasha Allen  
Air Permitting Section  
Bureau of Air  
Kansas Department of Health and Environment  
1000 SW Jackson, Suite 310  
Topeka, KS 66612-1366

Re: Updates to February 11, 2013 Construction Permit Application  
Naphtha Fractionation Project  
Source ID No. 0150004 - Frontier El Dorado Refining LLC  
El Dorado, Kansas

Dear Ms. Allen:

Frontier El Dorado Refining LLC (FEDR) is submitting this letter to provide you with updates to the Construction Permit Application for the Naphtha Fractionation Project (NFP).

**Deaerator Vent:**

FEDR proposes to update the permit descriptions for the HGU3 by including a Deaerator atmospheric vent in the HGU3 Unit. The purpose of the Deaerator Vent is to remove impurities from the steam being exported from the HGU3. The Deaerator Vent will be designed to minimize venting which will minimize loss of steam, as well as minimize emissions to the atmosphere.

The Deaerator vent contains impurities such as ammonia, methanol and carbon dioxide that are generated by the reforming process. The following tables in the application have been updated to include the emissions from this vent:

- Table B-13, HGU3 Potential Atmospheric Vent Emission Calculations
- Table 1-1, Project Emissions Increases Compared to PSD Significance Levels

These tables are included in Attachment 1 to this letter.

**BACT Analysis for CO<sub>2</sub> Emissions from Deaerator Vent:**

CO<sub>2</sub> from the Deaerator Vent is generated from the reforming process. The following are considered available control technologies for the vent:

- (1) Good design of the Deaerator Vent to minimize venting; and
- (2) Carbon Capture and Storage (CCS).

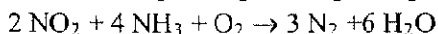
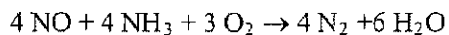
**Frontier El Dorado Refining LLC**  
1401 Douglas Road • El Dorado, KS 67042  
(316) 321-2200 • Fax (316) 321-8584  
<http://www.hollyfrontier.com>

As presented in Section 5 of the permit application for the Naphtha Fractionation project, the use of CO<sub>2</sub> capture at FEDR is economically infeasible and does not represent BACT for the HGU3 furnace. The analysis does not change with the addition of the vent as the CO<sub>2</sub> emissions from the vent stream are estimated to be approximate 0.13% of the amount of CO<sub>2</sub> emissions from the HGU3 Furnace. The remaining control option for the vent is good design to minimize venting, and is selected as BACT for the Deaerator Vent.

**SCR Vendor Guarantee:**

Per your request, vendor guarantee information for the SCR system is included in Attachment 2 to this letter. Please note that for the purposes of conservatively estimating emissions, FEDR proposes 0.01 lb NO<sub>x</sub>/MMBtu on an annual average basis for NO<sub>x</sub> emissions from the HGU3 furnace.

The SCR system will consist of a reactor chamber with a catalyst bed composed of catalyst modules, and an ammonia storage/handling/injection system. In the SCR process, aqueous ammonia diluted with air or steam is injected into the flue gas upstream of the SCR catalytic reactor. Ammonia reacts with NO<sub>x</sub> in the presence of the catalyst to form nitrogen and water according to the following reactions:



If you have any questions or comments regarding this submittal, please contact me at (316) 321-8478 or [Andrew.Beard@HollyFrontier.com](mailto:Andrew.Beard@HollyFrontier.com).

Sincerely,  
Frontier El Dorado Refining LLC



Andrew Beard  
Environmental Specialist

cc: Mr. Ward Burns, EPA region 7

Attachments

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**ATTACHMENT 1**  
**Updated Tables B-13 and Table 1-1**

**Table B-13**  
**HGU-3: Potential Atmospheric Vent Emission Calculations**  
**Frontier El Dorado Refinery**

Stream	Mass Flow Rate (lb/hr)	Methanol Composition (ppmw)	Ammonia Composition (ppmw)	CO <sub>2</sub> %	Methanol Emissions		Ammonia Emissions		CO <sub>2</sub>	
					(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Steam Superheat Coil	105,575.43	51	26	-	5.38	0.065	2.74	0.033	-	-
Degasifier	1,417.71	52	27	-	0.07	0.32	0.04	0.17	-	-
Blowdown Drum (Intermittent Blowdown)	20.00	7.3	2.8	-	1.22E-06	4.44E-07	4.67E-07	1.70E-07	-	-
Blowdown Drum (Degasifier down)	717.71	7.3	2.8	-	0.01	1.26E-04	2.01E-03	4.82E-05	-	-
Deaerator Vent	1100.00	300	440	5.25	0.33	1.45	0.48	2.12	57.75	252.95
<b>Total</b>					<b>5.79</b>	<b>1.83</b>	<b>3.27</b>	<b>2.32</b>	<b>57.75</b>	<b>252.95</b>

Notes:

- 1) The Steam Superheat Coil vents 12/hrs per cold startup and there are 2 cold startups/year
- 2) The Degasifier vent continuously
- 3) The Blowdown Drum (Intermittent Blowdown) vents for 30 seconds, once per shift, with 2 shifts per day
- 4) The Blowdown Drum (Degasifier down) vents 2 days per year
- 5) The Deaerator vent is continuous.

**Table 1-1 Project Emissions Increases Compared  
to PSD Significance Levels**

Source/ Source Category	Potential Emissions (tpy)											
	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	H <sub>2</sub> SO <sub>4</sub> Mist	H <sub>2</sub> S	NH <sub>3</sub>	HAPs	CO <sub>2</sub> e
New HGU-3 Furnace	9.20	8.98	36.79	4.96	6.85	6.85	6.85	-	0.045	4.82	1.74	188,663.01
HGU-3 Fugitives	-	-	-	0.12	-	-	-	-	-	-	0.05	0.64
SCR Fugitives	-	-	-	-	-	-	-	-	-	0.03	-	-
Crude Unit Fugitives (increase only)	-	-	-	7.61	-	-	-	-	-	-	3.04	39.94
Naphtha Fract. Tower Fugitives (net increase only)	-	-	-	1.31	-	-	-	-	-	-	0.52	6.89
ISOM Fugitives (increase only)	-	-	-	1.40	-	-	-	-	-	-	0.56	7.35
Gas Con Fugitives (increase only)	-	-	-	1.30	-	-	-	-	-	-	0.52	6.82
Cooling Tower (new)	-	-	-	0.47	0.12	0.12	0.12	-	-	-	-	2.48
Gasoline Tanks	-	-	-	0.10	-	-	-	-	-	-	0.04	-
Isomerate Tanks	-	-	-	2.55	-	-	-	-	-	-	1.66	-
HGU-3 Atmospheric Vent	-	-	-	1.83	-	-	-	-	-	2.32	1.83	252.95
HGU-3 Analyzer Vents	-	-	0.19	0.0004	-	-	-	-	-	-	-	2.08
<b>Total Project Increases</b>	9.20	8.98	36.98	21.66	6.97	6.97	6.97	0.00	0.045	7.17	9.97	188,982.16
<b>PSD Significance Level</b>	<b>40</b>	<b>40</b>	<b>100</b>	<b>40</b>	<b>25</b>	<b>15</b>	<b>10</b>	<b>7</b>	<b>10</b>	<b>N/A</b>	<b>N/A</b>	<b>75,000</b>
<b>PSD/Netting Required (Y/N)</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>N/A</b>	<b>N/A</b>	<b>Yes</b>

**ATTACHMENT 2**  
**SCR Vendor Guarantee**

**From:** [SCosper@technip.com](mailto:SCosper@technip.com) [<mailto:SCosper@technip.com>]  
**Sent:** Tuesday, July 02, 2013 9:04 AM  
**To:** Leigh, Donald R  
**Cc:** [VKhurana@technip.com](mailto:VKhurana@technip.com); [SSTung@technip.Com](mailto:SSTung@technip.Com); [SSekhri@technip.com](mailto:SSekhri@technip.com)  
**Subject:** Re: New H2 Plant (Holly El Dorado 17 MMSCFD H2 Plant)

Don:

Technip provides the guarantees you are looking for if we are purchasing and designing the SCR system (which we would be). The guarantee remains as previously discussed-

0.006 lb/MMBtu (HHV) corresponding to 5 ppm @ 3% O2 dry basis

Best Regards,  
Sara